

REMARKS

Claims 1 and 13 have been amended to correct omissions. These amendments raise no new issues. For example, the amendment of claim 3 to recite that the controller is coupled to said plurality of detectors merely repeats the same limitation already found in claim 1.

In the Final Rejection, all claims stand rejected as being obvious in view of prior art. Each obviousness rejection relies on either Churchill or Skutecki as teaching a controller that adjusts the rotational speed of a rotor in response to rotor signals. In each instance, the Examiner is clearly wrong. As will be demonstrated below, neither Churchill nor Skutecki disclose or suggest adjusting rotor rotational speed in response to rotor signals.

In ¶ 2 of the final action, claims 1-4 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Churchill et al. In view of the rejections of claims 10 and 12 set forth in ¶¶ 6 and 7, this ground for rejection should be corrected to include claims 10 and 12 also. The Applicant traverses this ground of rejection for the reasons previous given in response to the non-final action and for the following additional reasons.

Churchill discloses a system and a method for enabling immediate identification of aerodynamic imbalance independently of mass imbalance. [See Churchill, col. 2, ll. 11-15.] In the Background section, Churchill discloses that the only known method for demonstrating the existence of aerodynamic imbalance was:

by nulling vibration of the rotor by providing mass balance and then providing measurement of blade displacements due to changes in aerodynamic imbalance. Nulling of the rotor vibration involves controlling the rotor r.p.m. and changing the mass balance of the rotors until vibration or shaking is no longer experienced.

[See Churchill, col. 1, ll. 31-39.] It is this "nulling of rotor vibration" which the Examiner has misunderstood to be performed in response to rotor signals. On the contrary, nulling of rotor vibration is a preliminary step that must be taken before any rotor signals are received.

More specifically, in the fifth line of ¶ 3 of the final action, in support of the proposition that Churchill discloses "adjusting a rotational speed of [a rotor] in response to . . . rotor signals", the Examiner cites to column 3, lines 23-33, of Churchill, whereat a method for determining aerodynamic imbalance between propeller or rotor blades of an aircraft is disclosed. The first step of the aforementioned method is "reducing the rotational speed of the blades to a

level wherein any mass imbalance between the blades does not produce significant variation". [See Churchill, col. 3, ll. 25-28.] The second step of the method is "using a microphone to measure the pressure pulses produced by each blade during rotation thereof past the microphone". [See Churchill, col. 3, ll. 28-30.] The third step is "comparing the relative magnitudes of the amplitudes of the pressure pulses so produced so as to determine any discrepancies in the lift provided by the individual blades. [See Churchill, col. 3, ll. 30-33.]

The aforementioned first step, i.e., "reducing the rotational speed ...", corresponds to the "nulling of rotor vibration" discussed in the Background section of Churchill. That is, the rotational speed is adjusted "to a level wherein any mass imbalance between the blades does not produce significant variation". The step of reducing the rotational speed is a pre-condition for the measurement of aerodynamic imbalance using a microphone to detect pressure pulses. Since the rotor signals in Churchill are produced by the pressure pulses, which in turn are generated after the rotational speed has been reduced, it should be apparent that the rotor signals in Churchill are produced after the rotor rotational speed has been adjusted. Consequently, it is impossible that the rotational speed of the rotor in Churchill is adjusted in response to rotor

signals, as asserted by the Examiner.

In summary, Churchill teaches reducing the rotational speed of a rotor in order to avoid significant vibrations due to mass imbalance and then directly measuring lift differences between rotor blades by detecting pressure pulses, which are converted to rotor signals. [See Churchill, col. 5, ll. 36-45.] Clearly, the reduction in rotational speed occurs before, not in response to the rotor signals.

In view of the foregoing, the limitation "adjusting a rotational speed . . . in response to . . . rotor signals", recited in claim 1, is neither disclosed nor suggested by Churchill and a prima facie case for obviousness in view of Churchill alone has not been made. Accordingly, the rejection of claims 1-4, 10, 12 and 13 as being obvious over Churchill alone should be withdrawn.

With regard to the rejection of claim 10 as being obvious over Churchill, Applicant further traverses the Examiner's construction of the term "emitted energy" to include the pressure pulses of Churchill. This is not a "broadest reasonable interpretation" but rather is strained and mistaken. Claim 1 recites a plurality of rotors; claim 10 further recites a plurality of emitters. It is notable that claim 10 does not recites that each rotor comprises a plurality of emitters, but

rather that the emitters are separate and distinct from the rotors. The Examiner's interpretation requires that the emitters be the rotor blade tips of the rotor, which interpretation is inconsistent with Applicant's claim language.

In ¶ 8 of the final action, claims 1-4 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Churchill in view of Skutecki et al. In view of the rejections of claims 10 and 12 set forth in ¶¶ 12 and 13, this ground for rejection should be corrected to include claims 10 and 12 also. The Applicant traverses this ground of rejection for the reasons previous given in response to the non-final action and for the following additional reasons.

The obviousness rejection combining Churchill and Skutecki repeats the mistake of asserting that Churchill discloses "adjusting a rotational speed of at least one of said plurality of rotors in response to said rotor signals." Accordingly this second obviousness rejection is defective for the same reasons set forth above with regard to the first obviousness rejection.

In addition, this second rejection mistakenly asserts that Skutecki "discloses a controller that adjusts rotor speeds after receiving rotor signals" [see Action, p. 5, lines 7-8]. It is not surprising that this quote from the office action is

unsupported by any citation to Skutecki: a thorough reading of Skutecki reveals that adjusting the rotational speed of a rotor is not mentioned anywhere. Nor does Skutecki disclose that any "rotor signals" are produced by the helicopter rotors. Skutecki discloses an engine torque sensor 50 which provides a signal 51 representing the developed engine torque. Certain actions are taken when a torque limit is reached, namely, "the pitch axis no longer tries to hold airspeed but rather allows the airspeed to decrease as required to climb or level off at a new altitude" [see Skutecki, col. 2, ll. 54-57]. Nothing is said about detecting the rotational speed of the rotor or adjusting the rotational speed of a rotor in response to rotor signals. The reliance on Skutecki appears to be baseless. Accordingly, the rejection of claims 1-4, 10, 12 and 13 based on Churchill combined with Skutecki should be withdrawn.

In ¶ 14 of the final action, claims 1-6, 8, 10-13, and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Frank in view of Churchill and Skutecki. The Applicant traverses this ground of rejection for the reasons previous given in response to the non-final action and for the following additional reasons.

The obviousness rejection combining Frank, Churchill and Skutecki repeats the mistakes of asserting that Churchill

discloses "adjusting a rotational speed of at least one of said plurality of rotors in response to said rotor signals" [see Action, p. 7, 2nd and 3rd lines from bottom] and that Skutecki "discloses a controller that adjusts rotor speeds after receiving rotor signals" [see Action, p. 8, lines 4-5]. Accordingly this third obviousness rejection is defective for the same reasons set forth above with regard to the second obviousness rejection and should be withdrawn.

In ¶ 22 of the final action, claims 7 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Frank in view of Churchill and Skutecki, and further in view of Engels et al. The Applicant traverses this ground of rejection for the same reasons, set forth above, why claim 3 (on which claims 7 and 9 depend) is not obvious in view of Frank, Churchill and Skutecki.

In ¶ 24 of the final action, claims 3, 18-25, 37 and 38 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bass et al. in view of Frank, Churchill and Skutecki. The Applicant traverses this ground of rejection for the reasons previous given in response to the non-final action and for the following additional reasons.

The obviousness rejection combining Bass, Frank, Churchill and Skutecki repeats the mistakes of asserting that

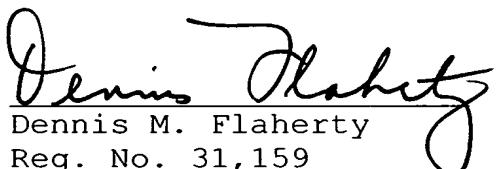
Churchill discloses "adjusting a rotational speed of at least one of said plurality of rotors in response to said rotor signals" [see Action, p. 10, last line to p. 11, line 2] and that Skutecki "discloses a controller that adjusts rotor speeds after receiving rotor signals" [see Action, p. 11, lines 6-8]. Accordingly this last obviousness rejection is defective for the same reasons set forth above with regard to the second and third obviousness rejections (see ¶¶ 8 and 14) and should be withdrawn.

In view of the foregoing, the Applicant submits that this application is now in condition for allowance. Reconsideration of the application and allowance of claims 1-13, 18-26, 37 and 38 are hereby requested. Upon the allowance of claim 3, the Applicant submits that withdrawn claims 14-17, which depend from claim 3, should also be allowed.

Respectfully submitted,

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